PATENT

COMPACTING METHOD AND APPARATUS

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CROSS REFERENCE TO RELATED APPLICATIONS: Not applicable.

STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT: Not applicable.

REFERENCE TO A SEQUENCE LISTING, A TABLE, OR A COMPUTER PROGRAM LISTING COMPACT DISK APPENDIX: Not Applicable.

BACKGROUND OF THE INVENTION:

[0001] The present invention relates to a compacting method and apparatus, and, in particular, a compacting method and apparatus employing the use of a forklift.

[0002] A major concern of metropolitan areas is refuse collection. Typically, industries within these areas incur significant expenses to collect and remove refuse. Current refuse collection systems involve the collection of refuse from local points and the transportation of this refuse to a disposal site located remote to the local points. Because of the hassle and inconvenience involved in refuse collection, these refuse collection systems are typically operated by independent contractors that will charge a fee based on various parameters, including the amount of trips that must be made to the disposal sites.

[0003] In the case that a refuse collection fee is directly related to the amount of pickups and the amount of filled refuse containers being picked up, it becomes desirable to pack as much refuse as possible into the containers. Accordingly, a device

sometimes used in refuse collection systems is a hydrolic packing ram. Although packing rams generally function to compact the refuse in containers, these rams tend to be very expensive and must be permanently installed and occupy valuable space. Additionally, packing rams require maintenance and electric service.

[0004] Accordingly, there remains a need for an inexpensive and effective refuse collection system.

SUMMARY OF THE INVENTION:

[0005] The following presents a simplified summary of the invention in order to provide a basic understanding of some aspects of the invention. This summary is not an extensive overview of the invention. It is not intended to identify key or critical elements of the invention or to delineate the scope of the invention. Its sole purpose is to present some concepts of the invention in a simplified form as a prelude to the more detailed description that is presented later.

[0006] According to its major aspects and briefly stated, the present invention is a method and system for compacting refuse in refuse containers such as roll off containers. As used herein, the term "roll off containers" refers to a refuse receptacle having an open top that is adapted to be carried by a vehicle, such as a truck. These receptacles are also referred to as "box rollers." The present system includes a forklift apparatus, which is used to engage a compaction weight. Once engaged, the compaction weight is placed over the open top of a roll off container including refuse.

Next, the compaction weight is lowered into the container by the forklift so as to compact the refuse.

[0007] A feature of the present invention is the use of a compaction method and system, which includes the combination of a forklift apparatus and a compaction weight. Heretofore, forklifts have been used primarily to lift and transport objects. However, the present invention permits a forklift to be used for the additional task of compacting, which was previously beyond its applicability. Additionally, the combination of a forklift apparatus with a compaction weight provides a relatively simple and economic way of compacting refuse in a receptacle such as a roll off container. As discussed, refuse compactors such as packing rams tend to be both expensive and complex. Further, packing rams must be permanently fixed and occupy valuable docking space for loading and unloading freight. In the present invention, the compaction system is portable and is 75% less than the cost of hydrolic packing rams. Moreover, the compaction system does not require any complicated machinery or special operator skill to implement. Finally, the compaction system can be conveniently stored and transported.

[0008] Another feature of the present invention is the use of a compaction weight that is dimensioned to be engaged by a forklift apparatus. The particular dimensions of the compaction weight contribute to the ease and simplicity of the compaction method and system. Furthermore, safety features can be included to the compaction weight to ensure that the forklift apparatus safely and effectively compacts the refuse in a receptacle without misplacing or dropping the weight during compaction.

[0009] Yet another feature of the present invention is the use of a compaction weight that is dimensioned to be received by a roll off container. The dimensions of the compaction weight can be particularly suited for compacting refuse within the roll off container. Therefore, the refuse can be most effectively and efficiently compacted without the need for multiple or complex compacting steps.

[0010] Other features and advantages of the present invention will be apparent to those skilled in the art from a careful reading of the Detailed Description of the Invention presented below and accompanied by the drawings.

BRIEF DESCRIPTION OF THE DRAWINGS:

In the drawings,

[0011] FIG. 1 is a side elevational view of a forklift apparatus and a compaction weight of a compaction system according to a preferred embodiment of the present invention;

[0012] FIG. 2 is a perspective view of a compaction weight according to a preferred embodiment of the present invention;

[0013] FIG. 3 is a side cross sectional view taken at Line 3-3 of FIG. 2 of a compaction weight according to a preferred embodiment of the present invention;

[0014] FIG. 4A is a front cross sectional view taken at Line 2-2 of FIG. 2 of a compaction weight according to a preferred embodiment of the present invention;

[0015] FIG. 4B and 4C are alternative detailed cross sectional views of the tine-receiving channels, according to a preferred embodiment of the present invention;

[0016] FIG. 5 is a perspective view of a safety feature of a compaction system according to a preferred embodiment of the present invention;

[0017] FIG. 6A is a side elevational view of a forklift apparatus and a compaction weight of a compaction system, with tines inserted in the channels of the compaction weight, according to a preferred embodiment of the present invention;

[0018] FIG. 6B is a side elevational view of a compaction system and a refuse receptacle, with compaction weight shown lifted by fork lift, according to a preferred embodiment of the present invention;

[0019] FIG. 6C is a side elevational view of a compaction system and a refuse receptacle, with lifted compaction weight poised over refuse receptacle, according to a preferred embodiment of the present invention;

[0020] FIG. 6D is a side elevational view of a compaction system with a refuse receptacle shown during compaction according to a preferred embodiment of the present invention;

[0021] FIG. 6E is a side elevational view of a compaction system with a refuse receptacle shown after compaction according to a preferred embodiment of the present invention;

[0022] FIG. 7 is a flow chart of a process according to a preferred embodiment of the present method.

DETAILED DESCRIPTION OF THE INVENTION:

[0023] Referring now to FIG. 1, there is shown a compaction system **10** of the present invention. As illustrated, the compaction system **10** includes a forklift apparatus **12** and a compaction weight **14**. The particular features of the forklift apparatus **12** are not critical. Generally, the forklift apparatus **12** can include a conventional forklift chassis **16** including a frame being conventionally mounted upon a wheel assembly including axle members (not shown) and wheel members **17**. A conventional drive assembly is conventionally mounted to the conventional forklift chassis **16** and includes a steering mechanism **18** and a foot pedal **20** being functionally and conventionally positioned at the front end of the forklift chassis **16**. Forklift apparatus **12** further includes a seat **22** for a forklift operator. Finally, a conventional lift assembly **24**

including a plurality of lifting tines **26** is movably and conventionally mounted upon a mast **27** located at the front end of the forklift chassis **16**.

[0024] The compaction weight **14** of the present invention is shown in detail in FIGS. 2-4. As illustrated, the compaction weight **14** generally has a box-like shape including a top surface **30** and an opposing bottom surface **31**, which are connected along the edges by side walls, **32**, **33**, **34**, **35** perpendicular to the top surface **30** and bottom surface **31**. Although no particular material is required for the construction of the compaction weight, preferably, the weight is made of a type of metal suitable for industrial applications, such as steel. On the top surface **30**, the compaction weight **14** carries means for engaging **40** forklift tines **26** such as channels **40**. Channels **40** are dimensioned to receive the tines **26** whereby the tines **26** are inserted into plural apertures **42**. Although channels **40** are shown in FIG. 4A as being carried on the top surface **30** such as by welding; alternatively, channels **40'** could be formed integrally with the top surface **30'**, as shown in FIG. 4B. Additionally, channels **40"** could be formed integrally beneath the top surface **30"** so that channels **40"** are built into the body of the compaction weight **14**, as shown by FIG. 4C. What is important to the practice of the invention is that the tines **26** of the forklift apparatus **12** include apertures in channels **40** dimensioned and formed to receive tines **26** so as to engage and support the compaction weight **14**.

[0025] Within its outer surfaces, the compaction weight **14** is hollow and adapted to receive a mass to add the sufficient amount of weight for the practice of the present

compaction method. For example, the compaction weight **14** can include plated steel, as well as crushed asphalt or cement. Additionally, the compaction weight **14** can include a flowable mass, such as water or sand. The particular material that is included within the weight **14** will depend on both the types of refuse being compacted, as well as the lifting power of forklift apparatus **10** employed. In making the compaction weight, the top surface **30** of the weight can be welded onto the weight after the weight **14** is appropriately filled with mass. Alternatively, the compaction weight **14** can include an inlet or port **44** that can receive flowable mass.

[0026] A particular feature of the present invention is the use of a compaction method and system, which includes the combination of the forklift apparatus **12** and the compaction weight **14**. Heretofore, forklifts have been used primarily to lift and transport objects. However, the present invention permits a forklift to be used for the additional task of compacting, which was previously beyond its applicability. Additionally, the combination of forklift apparatus **12** with compaction weight **14** provides a relatively simple and economic way of compacting refuse in a receptacle such as a roll off container. Because refuse compactors such as packing rams tend to be both expensive and complex and can take up a large amount of space within the receptacle, the compaction system **10** of the present invention is advantageous because it takes up no space within the refuse receptacle so that the receptacle can hold as much refuse as can be packed into it. Moreover, the compaction system **10** does not require any complicated machinery or special operator skill to implement.

[0027] As shown in FIG. 3, the compaction weight **14** of the present invention can also include means for securing compaction weight **14** to forklift apparatus **10**, such as a cable or a chain **46**. Chain **46** adds a safety feature to the compaction system **10**, because it ensures that compaction weight **14** remains engaged to the forklift apparatus **12** during operation.

[0028] As previously discussed, another feature of the present invention is the use of compaction weight **14** dimensioned to be engaged by forklift apparatus **12**. The particular dimensions of the compaction weight **14** contribute to the ease and simplicity of the compaction method and system. Furthermore, the use of the chain **46** contributes to the safe and effective compacting of refuse in a receptacle, and minimizes the concern of misplacing or dropping the weight **14** during compaction.

[0029] In use, as shown in FIG. 5, the chain **46** is wrapped around a rigid member that forms part of the forklift apparatus **12** such as a tine support **50**. Further, FIG. 5 shows how the tines **26** of the forklift apparatus **12** fit telescopically within the channels **40** to provide a secure and effective hold on the compaction weight **14**.

[0030] FIGS. 6A-6E illustrate the compaction method of the present invention, and FIG. 7 provides a flow chart summarizing this process. As shown, the forklift apparatus **12** engages the compaction weight **14**. In particular, the tines **26** of the forklift apparatus **12** are lifted by the forklift operator to an elevation that is level with the channels **40** of the compaction weight **14**. Next, the tines **26** are inserted into the

apertures **42** of the engaging means **40**. Optionally, the chain **46** is attached to the forklift apparatus **12**.

[0031] Once the compaction weight **14** has been effectively secured to the forklift apparatus **12**, the lift assembly **24** operates to lift the compaction weight **14** to an elevation that will be sufficient to clear the top edge of a roll off container **60**. The compaction weight **14** is next brought forward by the forklift apparatus **12** so that the compaction weight **14** is directly above refuse **62** contained by the roll off container **60**. To compact the refuse, the compaction weight **14** is simply lowered into the roll off container **60**. Finally, the compaction weight **14** is lifted and removed by the forklift apparatus **12** leaving behind a compacted roll off container **60**. Thereafter, additional refuse **62** can be added to the roll off container **60**, and the compacting steps can be repeated until the roll off container **60** is filled with compacted refuse.

[0032] Although the particular dimensions of the compaction weight **14** are not critical to the practice of the invention, preferably, the compaction weight **14** is dimensioned to be received by or fit within a standard roll off container **60**. Accordingly, the length, width, and depth of the compaction weight **14** is such that the roll off container **60** can receive compaction weight **14**. For example, the length of the compaction weight **14** taken along the longitudinal horizontal axis at Line 2-2, shown in FIG. 2, is preferably less than the length of the roll off container **60** taken along its longitudinal horizontal axis. Standard roll off containers **60** range from approximately 22 feet in length, approximately 6 to approximately 8 feet in width, approximately 4 to

approximately 7 feet in depth. Generally, these roll off containers exist in three main sizes that are capable of handle 20, 30, and 40 yards of volume of refuse.

[0033] It will be apparent to those skilled in the art that many changes and substitutions can be made to the preferred embodiment herein described with departing from the spirit and scope of the present invention as defined by the appended claims.